REMARKS

This case has been carefully reviewed and analyzed in view of the Official Action dated 21 November 2002. Responsive to the rejections made in the Official Action, Claims 1, 2, and 4 have been canceled by this Amendment and the subject matter thereof rewritten as new Claims 7 and 8. Further, Claims 3, 5, and 6 were amended and Claim 9 was appended to the Application to clarify the recitation of elements which form the invention of the subject Patent Application.

The Specification and Drawings have been amended to refer to the electrical leads and first and second coil terminals shown in the Drawings, as originally filed, by reference numerals 10, 11, and 12, respectively. The change was necessitated to more clearly recite the elements which form the subject input device. The changes to the Specification and Drawings are believed to avoid raising issues of new matter in that the input leads and first and second coil terminals are clearly shown in the Drawings, as originally filed, and the changes are therefore in accordance with MPEP § 2163.06.

The Specification has been amended to change the numerous occurrences of the word "permittivity" to the correct word "permeability". Applicant respectfully submits that one skilled in the art would recognize the use of the word "permittivity" in the discussion of first-order magnetic properties of materials to be an idiomatic or translational error. Thus, it is believed that the substitution of the word "permittivity" in

the Specification and Claims, as originally filed, with the correct term "permeability" does not constitute new matter and the change is in accordance with MPEP § 2163.07(II).

The Specification was further amended to correct a contradiction of subsequent clauses within the same sentence. The sentence beginning on Page 4, Line 10, as originally filed, begins "Parasitic capacitance between multiple layers of winding can be avoided..." (emphasis added), but then continues with "...and a low-impedance linkage path is provided for the high frequency current" (emphasis added). It is believed that the incongruity of the statement that the avoidance of parasitic capacitance would provide a low-impedance leakage path would be recognized as an obvious grammatical, idiomatic, or translational error to one of ordinary skill in the art, and that the correction thereof would not introduce new matter. Additionally, the sentence "The effective impedance of the coil is thus reduced" which, as originally filed, is intended to restate the facts of the previous sentence (as indicated by the user of the adverb "thus"), has been amended to read "Thus, a reduction of the high-frequency impedance of the coil is avoided", which is merely the restatement of the facts of the amended previous sentence. It is respectfully submitted that these changes are to correct errors that would be obvious to the skilled artisan and, per MPEP § 2163.07(II), do not introduce new matter.

The changes to the Specification were necessitated to correct idiomatic,

grammatical and translational errors and to bring the Specification to correspond to the amended Drawings. For the reasons discussed above, it is believed that no new matter was introduced by the changes. Additionally, marked copies of the original Specification pages containing the amended paragraphs are attached to this Response. The Substitute Specification paragraphs include the same changes as are indicated in the marked copies of the original Specification paragraphs.

In the Official Action, the Examiner rejected Claim 1 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention in that a functional limitation was incorporated into the Claim without support. As previously stated, Claim 1 has been canceled by this Amendment and new Independent Claim 7 has been drafted without the functional limitations cited by the Examiner.

The Examiner rejected Claim 2 under 35 U.S.C. § 112, second paragraph, as being indefinite for limiting the ferromagnetic core of the device of Claim 1, as originally filed, to have a high resistivity and a high permittivity. As discussed hereinabove, the use of the word "permittivity" was done in error and has been replaced by the word "permeability" in the Specification and amended Claims.

In the Official Action, the Examiner rejected Claims 1 and 3-5 under 35 U.S.C. § 103(a) as being unpatentable over Arikawa, et al. (U.S. Patent #4,057,774; hereinafter

"Arikawa"). The Examiner found that Arikawa discloses a fuse comprising a core member made from a highly heat conductive material and a wire strand spirally wound on the core member, the wire strand being made from a first metallic wire element over a second mutually fusible wire element. The Examiner further found that it was understood by the Claim and the illustrations that it would be inherent in a structure with a core and winding that the functions of an "inrush limiter", a "fusible link", and an "EMC choke" would be performed. With regard to the Examiner's latter assertion, Applicant respectfully disagrees. It is clearly shown in the illustration of prior art as given in FIG. 1 and the discussion thereof in the Section "Background of the Invention", that these functions are performed by separate subassemblies. As discussed in the Background of the Invention, a fuse performs the function of a fusible link, an inrush current limiter having a default low resistance value which increases as a result of an inrush current performs the function of the inrush limiter, and a basic EMC choke performing the function of the EMC choke of the multipurpose input device. As such, Arikawa does not show all of the elements to perform these three functions, neither separately nor in a single, discrete component. Arikawa does not disclose, or even suggest, the utilization of the spirally wound fuse element as an EMC choke, nor is it known in the art, as believed by Applicant, that an EMC choke has a deliberately fusible coil. It is believed that only the subject multipurpose input device, through a unique

combination of elements, performs the three functions of an inrush current limiter, a fusible link, and an EMC choke.

Arikawa fails to disclose or suggest a multipurpose input device having "a magnetic core...characterized by high magnetic permeability", and a "coil having...first and second terminals...being electrically coupled to a corresponding one of [a] pair of electrical leads, said coil being constructed from a fusible material and helically disposed about said magnetic core", as defined in the amended Claims of the subject Patent Application. Therefore, it is respectfully submitted that since Arikawa does not show or suggest the unique combination of elements of the present invention for the purposes disclosed in the subject Patent Application, Arikawa, either alone or in combination with the other reference cited by the Examiner, cannot make obvious that invention.

In the Official Action, the Examiner rejected Claims 2 and 6 under 35 U.S.C. § 103(a) as being unpatentable over Arikawa in view of Mayer (U.S. Patent #3,573,676). As previously stated, Claim 2 has been canceled by this Amendment, thus obviating the Examiner's rejection. Claim 6, however, is dependent from new Claim 7 which is now believed to be patentable over Arikawa for the reasons discussed hereinabove. Therefore, it is believed that Claim 6 is allowable for at least the same reasons for which Claim 7 is allowable. The modification of Mayer on Arikawa still does not show or suggest the invention of the subject Patent Application, as now claimed.

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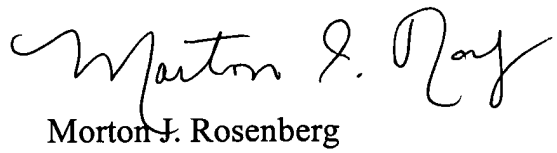
It is now believed that the subject Patent Application is in condition for allowance, and such action is respectfully requested.

Respectfully submitted,



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components series-connected on the AC circuit or decrease of quality.

The EMC choke 70 is a basic electromechanical component for providing a high-frequency impedance between an applications equipment and the AC input source. Because the high-frequency impedance of the EMC choke can divide a voltage with the impedance of the AC input source, the differential-mode noise generated on the AC input source due to the applications equipment will decrease because of this voltage division. At high frequencies, because the high-frequency impedance of the EMC choke 70 is much larger than the impedance of the AC input source, the noise affecting the AC input source will be greatly reduced.

However, the cost is high because of a large number of subassemblies. Also, storage, conveyance, and installation cannot be reduced or simplified. Moreover, because the three subassemblies are individually joined, they cannot be effectively integrated to reduce the volume.

Accordingly, the present invention aims to provide a multipurpose input device, which has a low cost and a reduced volume, and conforms to the requirements of safety and EMC.

Summary of the invention

The object of the present invention is to provide an input device having the functions of a fusible link, an inrush current limiter, and an EMC choke. A fusible resistance winding is wound around a magnetic component having a high resistance and a high permeability. Because the input device of the present invention can replace the conventional three separate subassemblies, the object of reducing the cost and shrinking the volume can be accomplished.

The various objects and advantages of the present invention will be more readily understood from the following detailed description when read in conjunction with the appended drawing, in which:

Brief description of the drawings:

Fig. 1 is a circuit diagram of a conventional converter for converting AC to DC;

Fig. 2 is a circuit diagram of a converter for converting AC to DC of the present invention;

Fig. 3 is a perspective view of the present invention; and

Fig. 4 is a perspective view of another embodiment of the present invention.

Detailed description of the preferred embodiments

As shown in Figs. 2 and 3, the present invention provides a multipurpose input device conforming to the requirements of safety and EMC. The multipurpose input device is series-connected between an AC input source and a rectifying circuit 3. In this embodiment of the present invention, the rectifying circuit 3 comprises a bridge rectifier D1-D4 and a capacitor C. The multipurpose input device comprises a magnetic component 1, a pair of electrical leads 10 and a resistance coil 2.

The magnetic component 1 is a magnetic core having ferromagnetic characteristic. The material of the magnetic core ought to have a high resistivity and a high ~~permittivity~~ permeability to bear voltage difference generated when the resistance coil 2 blows; otherwise, it is also feasible to use an appropriate coil frame or package mechanism to separate the magnetic core from the circuit.

The resistance coil 2 is a fusible/resistance winding wound around the

magnetic component 1. The resistance coil 2 has the functions of a fusible link, and is connected to electrical leads 10 at first terminal 11 and second terminal 12 an inrush current limiter, and an EMC choke. That is, it can limit the input current within a safe value, reduce the inrush current, and choke the noise affecting the AC input source.

As shown in Fig. 4, the surface of the multipurpose input device of the present invention is coated with a covering layer 4 having protection effect to avoid smoke or fire when the resistance coil 2 blows.

Additionally, the resistance coil 2 can be formed by assembling a first coil 21 of a smaller number of turns with a second coil 22 of a larger number of turns. Because the first coil 21 has only a layer of winding, it can reduce parasitic capacitance to be advantageous for resisting high frequency. Parasitic capacitance between multiple layers of winding can be avoided, and a low-impedance leakage path is ~~provided~~ prevented for the high-frequency current. ~~The effective~~ Thus, a reduction of the high-frequency impedance of the coil is ~~thus reduced~~ avoided. The second coil 22 is advantageous for resisting lower-frequency disturbance. Because of its structure of multiple layers of winding, a larger number of turns can be provided within a shorter length. For a cylindrical choke coil, the reactance is approximately proportional to the square of number of turns, and inversely proportional to the length. Therefore, a higher impedance for resisting low frequency can be obtained.

To sum up, the special design of the present invention has the following characteristics.

1. Low cost: Because a single component is used, the cost can be reduced, and conveyance and installation can be simplified.

SUBSTITUTE ABSTRACT

Abstract

The present invention provides a multipurpose input device installed at a front stage of a power supply circuit. The multipurpose input device is formed by winding a fusible/resistance winding around a magnetic component having a high resistivity and a high ~~permittivity~~ permeability. The fusible/resistance winding has the functions of a fusible link, an inrush current limiter, and an EMC choke. The conventional three separate subassemblies can be replaced with the multipurpose input device of the present invention to reduce the cost and shrink the volume. The present invention also conforms to the requirements of safety and EMC.